Technical data

Dissipation factor

Capacitance (nF)	Frequency (kHz)	tanδ (×10^{-4})
3.3–135	1	< 3
3.3–135	10	< 5
3.3–34.8	100	<20
36.5–135	100	<50

Measured at +23°C.

Pulse durability

The capacitor can withstand an unlimited number of pulses with a pulse steepness according to values given in table. The capacitors are sample tested with five times stated values and with 10000 pulses.

Capacitance (nF)	max dU/dt (V/µs)
3.3–10	40
10.5–35	30
36.5–135	10

Inductance

Measured 1.5 mm from the body of the capacitor. Typical value 12 nH. Maximum value 15 nH. Add 1.5 nH/mm for extra wire length.

Terminals

Heavily tinned, low resistance wires are placed symmetrically along the base diagonal.

Needle flame test

According to IEC Publ. 695-2-2 with underlaying layer of tissue paper. The flame can be applied for 20 seconds, without any glowing particles falling.

Rated capacitance

According to article table. The E12 and E48 series are preferred. Measured at +23°C and at 1 kHz. Other values on request.

Long term stability

After three years at rated voltage, a maximum temperature of +50°C and max 70% relative humidity, the capacitance drift will not exceed 0.1% +2 pF.

Reliability

The failure rate of PHE 425 is so low that reliability data referring to normal operation cannot be achieved in laboratory tests. However operational statistics for a total of 0.6×10^6 unit-hours with no failure have revealed a mean failure rate of $\leq 3 \times 10^{-9}$/h.

Temperature coefficient

The linear relation between temperatur and capacitance is valid for the total temperature range −55°C to +85°C is −200 ±100 ppm/°C.

Capacitance (nF)	Temperature coefficient typical values (ppm/°C) <23°C	(ppm/°C) >23°C
3.3–10	135±35	170±60
10–35	180±30	235±40
35–135	205±35	250±50

Environmental and testing data

Soldering heat

According to IEC 68-2-20 Test TB, Method 1A (Solder bath 260°C during ten seconds).

The following requirements are met:
1. ΔC/C ⩾ 0.5%
2. The change in tanδ ⩽ 20 × 10^{-4} at 100 kHz or lower than 5 × 10^{-4} at 10 kHz.
3. No visible damage.

Endurance test DC

2,000 h at 1.25 × U_R and 85°C. The following requirements are met:
1. Insulation resistance more than 100 GΩ
2. Other requirements according to "Soldering heat"

Endurance test AC

1000 h at 1.35 × U_R (VAC) and 85°C. The following requirements are met:
1. Insulation resistance more than 1004Ω.
2. ΔC/C < 5% at 1 kHz
3. Δtgδ < 15.10−4 at 1 kHz

Damp heat steady state

According to IEC 68-2-3 Test Ca. The same requirements as under "Solder heat" shall be met after 56 days at +40°C and relative humidity of 93%.

Bump

According to IEC 86-2-29 Test Eb mounted on a PCB. 4 000 bumps with a peak acceleration of 390 m/s^2. The same requirements as under "Solder heat" will be met.

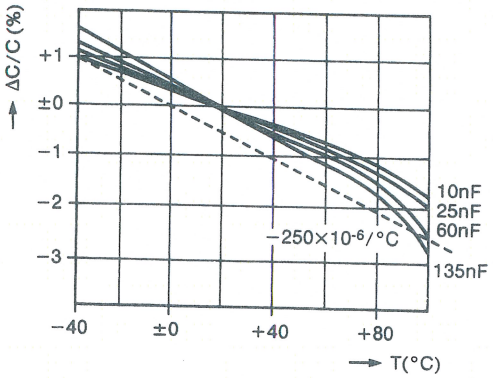
Vibration

According to IEC 68-2-6 Test Fc procedure B4. Six hours with 10–200 Hz and 0.75 mm displacement amplitude.

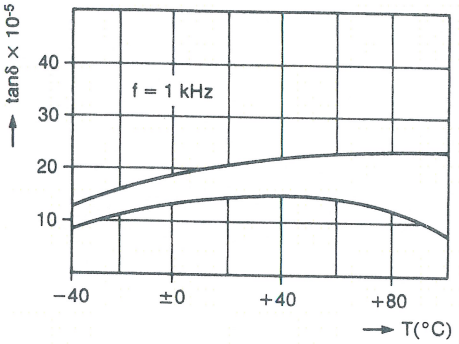
Low air pressure

According to IEC 68-2-13 Test M. The capacitor shall be stored at 20 mbar (2 kPa) for one hour. The last five minutes with rated voltage between the terminations. The requirements states no breakdowns or flashovers may occur in the voltage test and no visible damage.

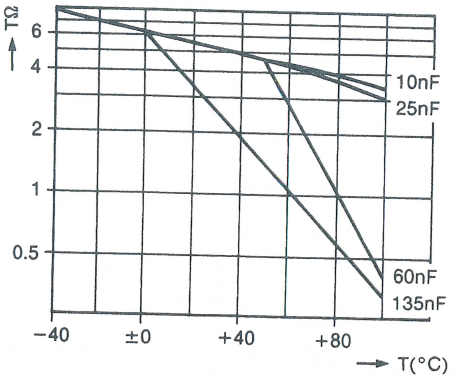
Typical data as diagrams



Capacitance vs. temperature

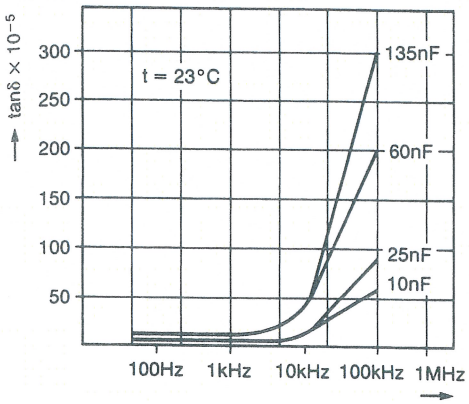


Tanδ vs. temperature

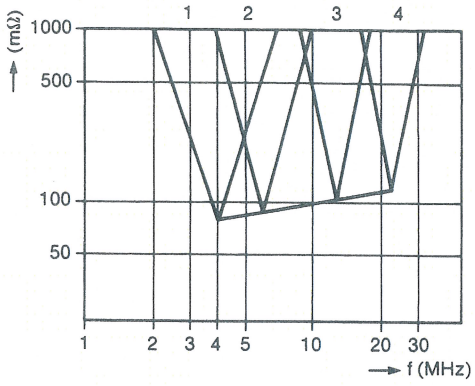


Insulation resistance vs. temperature

Typical data as diagrams

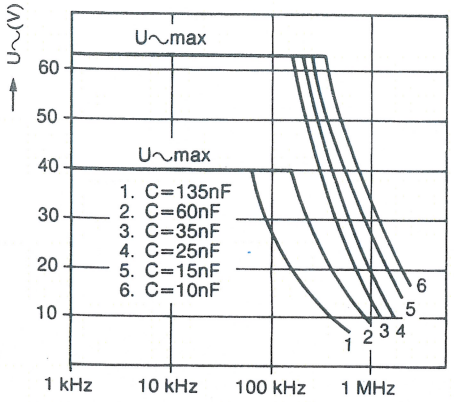


Tanδ vs. frequency



Resonance diagram (2 mm from cap. body)

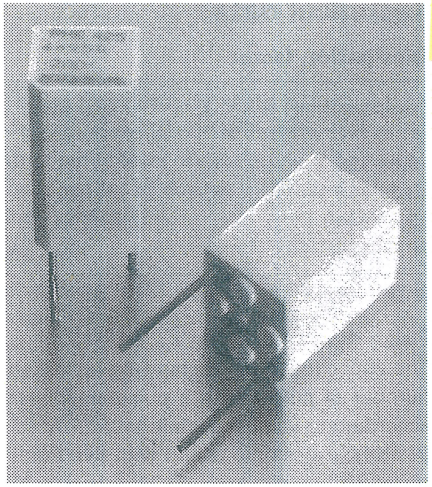
1 = 140 nF
2 = 60 nF
3 = 15 nF
4 = 4 nF



Permitted AC-voltage VS. frequency

PHE 425

- High capacitance density
- High stability
- High reliability



Applications

This capacitor covers 7.5 × 7.5 mm PCB area, and together with RM6 ferrite cores, can be designed into very dense constructions i.e. LC-filters in telephone systems or measurement equipment. Timing circuits.

Basic data

Capacitance range (nF)	3.3–10	10–35	35–135
Rated voltage U_R (VDC)	250	100	63
(VAC, 50 Hz)	125	63	40
Capacitance tolerance	1%, 2%, 5%		
Climatic category	55/85/56		
IEC standard	384-16, Grade 1, Stability class 1		

CECC-approval

PHE 425 has its properties documented in its own detail specification.

Compared to the standard sectional specification the AQL levels are lower for PHE 425. Standards ( )
Visual inspection, 1.0% (2.5%)
marking and
dimensions
Voltage proof C, 0.25% (1%)
tanδ and insulation
The complete detail specification will be seat on request.

Basic design

The winding in PHE 425 is metallized polypropylene. The construction is made to achieve low inductance and low ESR.

The encapsulation is made of self-extinguishing material (UL 94/V-O).

the capacitor will withstand all commonly used solvents and rinsing liquids without damage. The mechanical design will assure narrow tolerances.

Article table

Capacitance (nF)	Rated voltage (VDC)	(VAC)	Article type
3.3–10	250	125	PHE 425 HB. . . . .
10.5–34.8	100	63	PHE 425 DB. . . . .
36.5–135	63	40	PHE 425 CB. . . . .

Ordering information

(Rifa article number)
(i.e. 15000 pF, 2%, 10 mm lead length)

P	H	E	4	2	5	D	B	5	1	5	0	G	R	1	0	C

Article type
No. of digits in cap. value (pF)
Sign. digits according to table above
Code for tolerance
Lead length (when not standard 3.1 mm)
If CECC approved cap. is requested

Capacitance tolerances

Tolerance (%)	Tolerance code
5	J
2	G
1	F

Package

The capacitors are delivered in boxes containing 1000 pieces.

Dimensions in mm

Mechanical dimension

W 7.4 $^{+0.1}_{-1}$ mm

H ⩽ 13.1 mm
a 5.08 ±0.1 mm
R Standard 3.1 ±0.3 mm
Optional 6–10 mm with tolerance $^{+0}_{-1}$

d 0.6 mm
Weight 1.09 g/each

